EXHIBIT I

UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

BARCO, INC. and BARCO NV,)	
)	
Plaintiffs,)	Case No. 2:23-CV-0521-JRG-RSP
)	
v.)	
)	
YEALINK (USA) NETWORK)	
TECHNOLOGY CO., LTD., and)	
YEALINK NETWORK)	
TECHNOLOGY CO., LTD.)	
)	
Defendants.)	

EXPERT DECLARATION OF MICHAEL C. BROGIOLI, Ph.D.
REGARDING CLAIM CONSTRUCTION

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I.   INTRODUCTION

1.   I am over the age of eighteen. I am competent and qualitied to make this declaration and give testimony under oath. I have been retained by Plaintiffs in this action, Barco, Inc. and Barco NV (collectively refer to as "Barco"). I am being compensated at my standard consulting rate for my time spent on this matter through Elysium Digital LLC, who I understand charges $950 per hour of my time. My compensation is not contingent upon the testimony I provide or the outcome of this matter.

2.   I have been asked to review certain materials and provide my opinions regarding the matters discussed herein. The facts and opinions set forth in this Declaration are based on my own personal knowledge, observations, and information available to me at the time of this declaration.

3.   I have made every effort to accurately and completely investigate and opine on the relevant areas described herein. Where applicable, the findings presented are made to a reasonable degree of scientific certainty. I reserve the right to supplement this report if and when new information becomes available after this report is signed, including but not limited to, additional discovery or documents, opinions of the court, and the opinions or testimony of other experts. I reserve the right to respond to any opinions offered by other experts and to any testimony offered at trial. Additionally, I reserve the right to create graphics or demonstratives to support my opinions and aid the court if I am called to testify.

II.   EXPERIENCE

4.   Below is a summary of my education and experience. My *curriculum vitae* ("CV"), included as **Appendix A** hereto, records my education, experience, and publications in greater detail.

5.   I am currently an Adjunct Professor of Electrical and Computer engineering at Rice

University in Houston, Texas, and Managing Director of Polymathic Consulting in Austin,

Texas. I received my Bachelor of Electrical Engineering from Rensselaer Polytechnic Institute in

1999, my Master of Science in Electrical and Computer Engineering from Rice University in

2003, and my Doctorate of Electrical and Computer Engineering from Rice University in 2007.

6.   While at Rice University, I developed various computer architecture designs for

embedded and high-performance systems, including multi-core and low power systems used in

processing various workloads, including multimedia and other workloads. For example, from

1999 to 2003, I worked in the area of low-power computing, specifically focusing on dynamic

power management and performance of configurable computing and memory systems with

workloads including multimedia and signal processing. From 2002 to 2004, I developed Spinach,

a computer architecture design and modeling toolset, which models system components common

to all programmable computing environments, including memory systems, multi-core

microprocessor systems, and related hardware components. These systems targeted networking

hardware and software solutions.   From 2004 to 2009, I developed Spinach DSP-FPGA, a

modular and composable simulator design infrastructure for programmable and reconfigurable

embedded SOC architectures specifically targeting mobile, low-power, and embedded and

portable computing devices running networking and multimedia workloads. From 2005 to 2009,

I developed and published a retargetable compiler infrastructure and hardware design exploration

toolkit for systems microprocessor design, which facilitated the design space exploration of

microprocessors and multi-core processor designs. Many of these tools have been used at United

States universities in the area of electrical and computer engineering research.

7.   In the late 1990s, I was a hardware and software developer at Vicarious Visions in New York, developing third-party titles for Nintendo's handheld consoles, in addition to various hardware and software interfaces and solutions.   These were used for the optimization and transfer of audio and graphics streams from developer workstations (desktop computers) to the peripheral consoles, via custom hardware and software solutions. During my career, I have served as Chief Technology Officer, advisory board member, and board of directors' member, often in co-founding roles.

8.   From June 2006 to August 2007, I worked as the Technical Co- Founder of Method Seven LLC in Boston, MA, working with high-performance software and hardware systems architecture. I am currently a co-founder, co-inventor, and Chief Technology Officer of Network Native, an Internet of Things technology company as well as well as others that are detailed on my CV (**Appendix A**).

9.   I have held the position of Adjunct Professor at Rice University since 2009 and the position of Managing Director at Polymathic Consulting since 2011. At Rice University, I instruct graduate-level curriculum in the areas of computer architecture, hardware and software systems, including multimedia processing and various codecs and optimizations for emerging architectures. I also advise on university research and various design initiatives, including the design of audio and media processing solutions for multiprocessor systems. At Polymathic Consulting, I work with a range of technologists from early-stage start-ups to Fortune 500 companies on similar technologies.

10.   From 2008 to 2009, I was Senior Engineer working in high- performance compiler designs and next-generation multi-core microprocessors and architectures at Freescale Semiconductor in Austin, TX. From November 2009 to October 2011, I was Chief Architect,

Senior Member Technical Staff, at Freescale Semiconductor in Austin, TX (formerly Motorola), responsible for management of technology, engineering roadmaps, design lead on software infrastructure, and next-generation multi-core microprocessor architectures. During my tenure at Freescale Semiconductor, I was in charge of system developer tools. These included tools used for the programming of processors, simulation and modeling, and related technologies including digital networking and multimedia solutions.

11.   I have previously worked for Texas Instruments' Advanced Architecture and Chip Technology division in Houston, Texas, in the areas of high-performance mobile and embedded systems design at the hardware and systems software level, specifically around heterogeneous computing, including solutions used in multimedia processing. I also have worked at Intel Corporation's Microprocessor Research Labs in the areas of computer architecture and compiler technologies.

12.   I am recognized as an expert in the field of computer architecture, computer hardware and computer software systems as they relate to the subject matter at hand. I am a member of the Institute of Electrical and Electronics Engineers (IEEE) and Association for Computing Machinery (ACM) and have been a steering committee member for the IEEE and ACM Design Automation Conference since 2011, and have previously held the role of Program Chair of Design Automation Conference in the area of Embedded Computing. I have also been a reviewer and contributor to a number of IEEE and ACM technical conferences during the course of my career.

13.   Over the past 20 plus years, I have authored numerous peer-reviewed publications, as well as engineering books in the area of computer hardware and software design, including solutions for and optimization of codec technologies. Many of these incorporate technologies

specific to the subject matter at hand. These publications are disclosed in my CV, attached as **Appendix A**. I have previously served as an engineering consultant and testifying witness on matters related to, and including, microprocessors and multi-core technology as well as audio and video processing technology, peripherals and interfaces similar to those mentioned in the patents at suit in this matter. My curriculum vitae contains more information on my background and experience, as well as the cases in which I have served as an expert witness over at least the past four years.

III.   MATERIALS CONSIDERED

14.   I have reviewed and considered the patents asserted in this case: U.S. Patent Nos. 10,762,002 B2 (the "'002 Patent"); 10,795,832 B2 (the "'832 Patent"); 10,904,103 (the "'103 Patent"); 11,258,676 (the "'676 Patent"); 11,403,237 (the "'237 Patent"); and 11,422,951 B2 (the "'951 Patent") (collectively, the "Asserted Patents").

15.   I have also reviewed the prosecution histories of the Asserted Patents before the United States Patent Office.

16.   I understand that Barco has accused Defendants Yealink (USA) Network Technology Co., Ltd. and Yealink Network Technology Co., Ltd. (collectively "Yealink") of infringing the Asserted Patents.

17.   I understand that Barco is alleging infringement of at least the following claims:

- Claims 1-7 and 10 of the '002 Patent

- Claims 1-4, 6-8, 13-14, and 16-19 of the '832 Patent

- Claims 1, 2, 16-17, and 19-20 of the '103 Patent

- Claims 1-20 of the '676 Patent

- Claims 1-5, 7-8 and 19 of the '237 Patent

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- Claims 1-15, and 17-21 of the '951 Patent

18.   I understand Yealink has admitted they infringe at least independent Claim 1 of each of the Asserted Patents.

19.   I understand that Yealink bears the burden of proving invalidity, and that burden is a particularly high burden referred to as "clear and convincing evidence." I further understand that the Asserted Patents, like all issued patents, are presumed to be valid.

20.   I reserve my right to review and respond to any opinions of Dr. Almeroth, who I understand to be Yealink's expert in this matter, including any opinions on the purported invalidity of any claim of the Asserted Patent.

IV.   LEGAL STANDARDS

21.   I have been informed that Yealink contends certain claims are indefinite. I have further been informed that the Supreme Court of the United States of America, the highest court in the country, has held that "a patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, *with reasonable certainty*, those skilled in the art about the scope of the invention." I understand this to be the Supreme Court's interpretation of the statute regarding patents, a statute that states that a patent specification must conclude with "one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention."

22.   I have been further informed that definiteness of a patent claim is to be evaluated from the perspective of someone skilled in the relevant art or a person of ordinary skill in the art ("POSITA"). This perspective is to account for not only the claims, but the claims as they are read in view of the patent's specification and the prosecution history, as well as a number of other factors that I discuss below in Section VII.

23.   I understand that terms do not need to be crystal clear to be definite, such that a "modicum of uncertainty" is allowed, so long as a POSITA has reasonable certainty regarding the scope of the claims and their meaning.

24.   I further understand that a claim that may be open to multiple interpretations, and that, in and of itself, does not render a term indefinite.

25.   Moreover, I further understand that a broad claim is not indefinite just because it encompasses a wide scope of subject matter, so long as that scope is reasonably certain to a POSITA.

26.   I have applied these principles when arriving at my opinions below.

V.   PATENTS-IN-SUIT

27.   The Asserted Patents generally relate to "electronic tools for meetings with audio including methods or devices for providing connection to a communications network." '002 Patent, 1:4-6.

28.   The patent specification, which is substantially similar across the Asserted Patents and spans more than sixteen pages, describes how different participants can share data from a processing device (e.g., a laptop or PDA). '002 Patent, 16:16-28, Fig. 1. The Specification explains that through the use of connection units (also referred to in the specification as peripheral devices, and dongles), a user can share media content (including audio and visual data) via a network to a base unit or display node. *Id.* at 16:45-60. An example of a dongle is shown in the figures, specifically Figure 10, reproduced below:
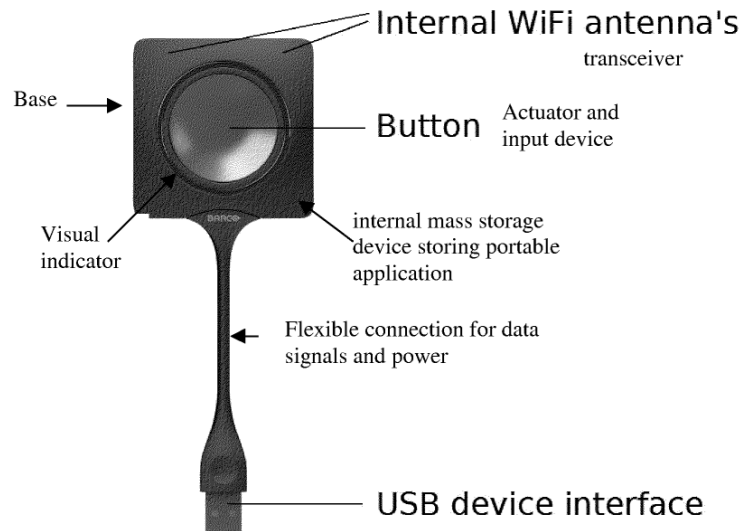
Fig. 10

29.   An example of a meeting room set up that includes multiple users or participants **37**, each

with their own processing device (an example of which is a laptop) **31** and dongle (which

includes an input device **48** and connection unit **47**) is shown in the figures, and specifically in

Figure 1a, reproduced below. It further depicts microphones **38**, audio equipment **46**, cameras

35, **39**, **40**, and **41**, networks **50**, **51**, and **43**, display **44**, whiteboard **45**, connection units **49** and

52, router **42**, and base node **36**.

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Fig. 1a
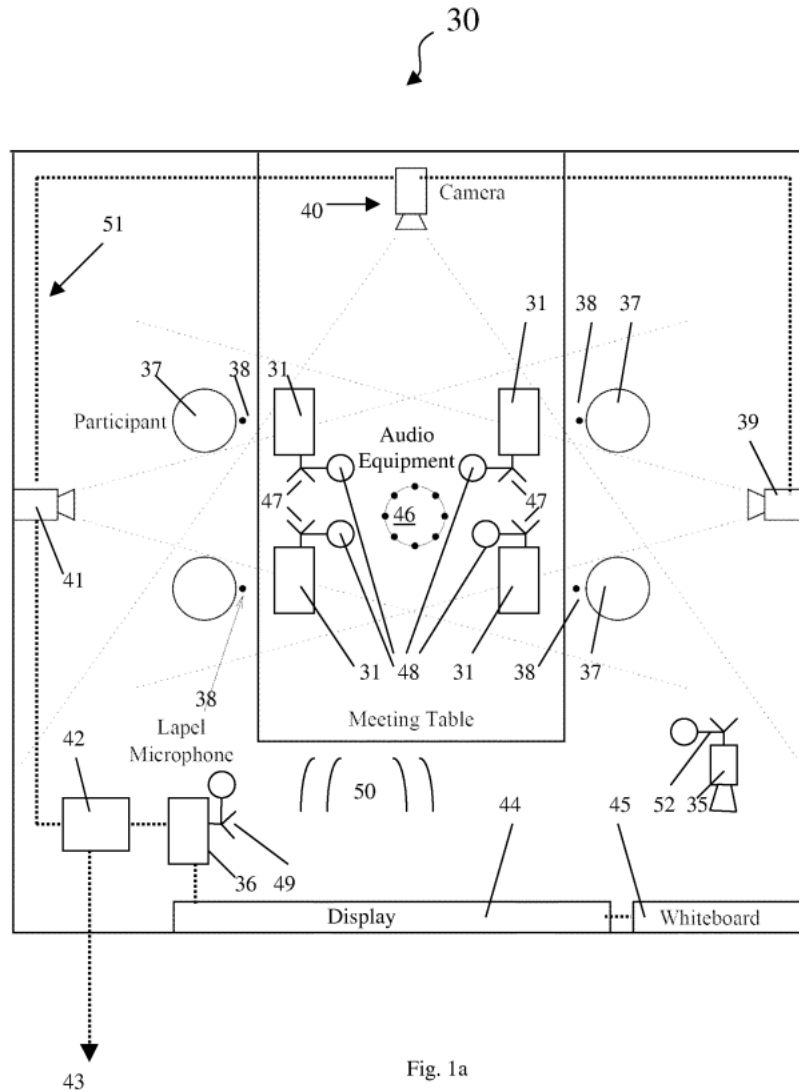
30.   There is additional detail in the specification of the content and specifics of operation that are relevant and referred to herein.

VI.   LEVEL OF SKILL IN THE ART

31.   I have been asked to consider the following proposal for the appropriate level of skill in the art of the Asserted Patents:

- a person having at least a Master's Degree in Electrical Engineering with at least five years of work experience in computer science and embedded systems, or a Master's Degree in Computer Science with at least five years of work experience in electrical and

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computer engineering and embedded systems. Additional education experience could substitute for the some of the work experience.

32.   Given the disclosures in the Asserted Patents, the claim scope, what I have been informed is the educational level of the inventors and their work experience, I agree that this is an appropriate level of skill in this art. Based on this same information, it is also my opinion that this is a correct level of skill in the art for a POSITA of the Asserted Patents.

33.   I have greater experience than this level, yet have placed myself in the shoes of someone having this degree of education and work experience when analyzing the patents and when forming my opinions herein.

VII.   OPINIONS

34.   I have prepared a chart identifying the terms that Yealink contends are indefinite:

Term	Claims/Patents in which the term is found
"means for audio communication"	'002 Patent (Cl. 1)
"means for data communication"	'002 Patent (Cl. 1,
"means for communication"	'676 Patent (Cl. 1)
"the at least one peripheral device"	'103 Patent (Cl. 1, 16)
"the audio device"	'237 Patent (Cl. 2)

35.   For the last four terms in the chart, I understand that Yealink's invalidity contentions only allege an indefiniteness theory based on a purported lack of antecedent basis. To the extent Yealink identifies any other invalidity theory for these terms as it relates to indefiniteness, I reserve the right to supplement my opinions.

36.   I disagree that any of these terms are indefinite as, a POSITA reading the claim as a whole and the patent specification, would be informed, with reasonable certainty, the scope of the claimed invention. I address each term in detail below.

A. "means for audio communication"

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37.   This term appears in Claim 1 of the '002 Patent. I understand that Yealink has admitted that it infringes Claim 1 of the '002 Patent. As a result, Yealink understands the scope of the claim, including this term, to cover its Accused Products and there does not appear to be a dispute about the scope and content of this claim term. As such, I do not believe construction is necessary for "means for audio communication."

38.   To the extent Yealink or its expert advances any theory regarding why an admittedly infringed claim needs construing or is indefinite, I reserve my right to respond to such opinion.

39.   I also have been asked to identify the function and structure associated with this term, including where such support exists in the specification. It is my opinion that the function of the means for audio communication is to "provide audio communication between the peripheral device and the processing device." This function is accomplished through an interface that uses a generic communications protocol. Examples of this structure can be found in the specification of the '002 Patent, at, for example, 14:32-46; 18:19-28; 18:29-40; 18:60-61; 18:64-67; 19:10-35; 19:50-20:12; 23:26-24:20; 30:15-19; 30:20-30; 30:36-31:42; 31:57-58; 32:11-42; 32:57-66; Figs. 1a, 3-5, 7-11.

   B. "means for data communication"

40.   This term appears in Claim 1 of the '002 Patent. I understand that Yealink has admitted that it infringes Claim 1 of the '002 Patent. As a result, Yealink understands the scope of the claim, including this term, to cover its Accused Products and there does not appear to be a dispute about the scope and content of this claim. As such, I do not believe construction is necessary for "means for data communication".

41.   To the extent Yealink or its expert advances any theory regarding why an admittedly infringed claim needs construing or is indefinite, I reserve my right to respond to such opinion.

42.   I also have been asked to identify the function and structure associated with this term, including where such support exists in the specification. It is my opinion that the function of the means for data communication is to "provide data communication between the peripheral device and the processing device." This function is accomplished through an interface that uses a generic communications protocol. Examples of this structure can be found in the specification of the '002 Patent, at, for example, 14:32-46; 18:19-28; 18:29-40; 18:60-61; 18:64-67; 19:10-35; 19:50-20:12; 23:26-24:20; 30:15-19; 30:20-30; 30:36-31:42; 31:57-58; 32:11-42; 32:57-66; Figs. 1a, 3-5, 7-11.

C. "means for communication"

43.   This term appears in Claim 1 of the '676 Patent. I understand that Yealink has admitted that it infringes Claim 1 of the '676 Patent. As a result, Yealink understands the scope of the claim, including this term, to cover its Accused Products and there does not appear to be a dispute about the scope and content of this claim. As such, I do not believe construction is necessary for "means for communication."

44.   To the extent Yealink or its expert advances any theory regarding why an admittedly infringed claim needs construing or is indefinite, I reserve my right to respond to such opinion.

45.   I also have been asked to identify the function and structure associated with this term, including where such support exists in the specification. It is my opinion that the function of the mean for communication is to "provide communication between the peripheral device and the processing device." This function is accomplished through an interface that uses a generic communications protocol. Examples of this structure can be found in the specification of the

'002 Patent,[1] at, for example, 14:32-46; 18:19-28; 18:29-40; 18:60-61; 18:64-67; 19:10-35; 19:50-20:12; 23:26-24:20; 30:15-19; 30:20-30; 30:36-31:42; 31:57-58; 32:11-42; 32:57-66; Figs. 1a, 3-5, 7-11.

D. "the at least one peripheral device"

46.   This term appears in Claim 1 of the '103 Patent. I understand Yealink has admitted that it infringes Claim 1 of the '103 Patent. As a result, Yealink understands the scope of the claim, including this term, to cover its Accused Products and there does not appear to be a dispute about the scope and content of this claim. As such, I do not believe that construction is unnecessary for "the at least one peripheral device".

47.   I understand that the word "a" in patent law means "one or more." In this regard, where the preamble of Claim 1 of the '103 Patent introduces "a computer peripheral device," a POSITA would understand that peripheral device to be the peripheral device that is later used in Claim 1, where the claim states "whether or not the arbitrary media content is being sent from *the at least one peripheral device* to the communications network." The '103 Patent refers to peripheral devices over 200 times, so I have not cited all instances, but it is clear from the specification and the claim what is intended when the '103 Patent Claim 1 refers to data being sent from the at least one peripheral device.

48.   Moreover, this term "the peripheral device" appears in at least Claims 4, 5-7, 13, and 19, such that it is clear to a POSITA that "the peripheral device" refers to the previously introduced "a computer peripheral device" in the preamble of Claim 1.

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[1] The three "means" terms are related in subject matter, and for ease of preparation and continuity, I have provided citations to the '002 Patent for all three terms. The '002 Patent has an identical specification as its continuation, the '676 Patent, as it relates to the passages I have identified for this term.

49.   The sole point of potential lack of clarity is tied to the antecedent basis of this term; it would be clear to a POSITA that this is simply a transcription or typographical type error, and the scope and content of claim is more than reasonably clear to a POSITA reading the claim, specification, and other claims of the '103 Patent.

50.   Based on the specification's clear disclosure of peripheral devices, it is clear from the context of the other claims and the specification of the '103 Patent what the scope and content of "the at least one peripheral device" is: the same peripheral device introduced in the preamble, "the computer peripheral device."

51.   It is my opinion that a POSITA would be informed, with reasonable certainty, as to the scope of Claim 1 of the '103 Patent, as was Yealink, when it admitted to infringing Claim 1.

   E. **"the audio device"**

52.   This term appears in Claim 2 of the '237 Patent. Claim 2 depends from Claim 1, which Yealink has admitted it infringes, and adds the limitation "wherein the audio device comprises an audio output adapter device which is configured as a virtual audio device to transfer the audio data from the processing device to the base node via the communications network."

53.   I note that while there is not antecedent basis for the noun "the audio device," Claim 10 of the '237 Patent provides that the system of Claim 9, further includes an audio device. *See* Claim 9 of the '237 Patent.

54.   The specification of the '237 Patent repeatedly references an audio device as part of the method for connecting a processing device to a communications network. *See* the '237 Patent 30:59-61 ("on every PC-like platform, there is standard built-in support for a USB audio device"); 31:26-28 ("It will preferably then decrypt and decode… and delivery the resulting signal to the physical audio device"); 32:5-7 ("Commercially available processing devices

currently support external USB audio devices through a generic built-in USB audio software driver"); 33:13-16 ("On the peripheral device 32, the audio packets are read from the generic port, e.g. USB port 11 by a dedicated audio device 14").

55.   The sole point of potential lack of clarity is tied to the antecedent basis of this term; it would be clear to a POSITA that this is simply a transcription or typographical type error, and the scope and content of claim is more than reasonably clear to a POSITA reading the claim, specification, and other claims of the '237 Patent.

56.   Based on the specification's clear disclosure of an audio device and the context of the other claims of the '237 Patent, the scope and content of the claimed audio device of Claim 2 of the '237 Patent is: an audio device comprising an audio output adapted device which is configured as a virtual audio device to transfer the audio data from the processing device to the base node via the communications network.

57.   It is my opinion that a POSITA would be informed, with reasonable certainty, as to the scope of Claim 2 of the '237 Patent.

58.   I declare under penalty of perjury that this declaration contains a true and correct statement of my opinions, based on the information available to me.

Dated: December 17, 2024   _____

                                            Dr. Michael C. Brogioli

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Michael C. Brogioli, Ph.D.

Contact Information

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Expertise

Software Analysis, Software Architecture, Embedded Computing, Microprocessor Designs, Software Based Simulation, Computer Hardware Design, Computer Networks, Computer and Network Based Gaming Platforms, High Performance Computing, Digital Signal Processing.

Education

Rice University, Houston, Texas USA

Ph.D., Electrical and Computer Engineering, 2007

- Dissertation Topic: "Reconfigurable Heterogeneous DSP/FPGA Based Embedded Architectures for Numerically Intensive Embedded Computing Workloads."
- Advising Committee: Dr. Joseph R. Cavallaro, Dr. Keith D. Cooper, Dr. Scott Rixner

Rice University, Houston, Texas USA

M.S., Electrical and Computer Engineering, 2003

- Dissertation Topic: "Dynamically Reconfigurable Data Caches in Low Power Computing."
- Advising Committee: Dr. Keith D. Cooper, Dr. Scott Rixner, Dr. Robert Jump

Rensselaer Polytechnic Institute, Troy, New York USA

B.S., Electrical Engineering, Cum Laude, 1999

- Advisor: Dr. William Pearlman

Certificates

Harvard Business School, Boston, Massachusetts, USA

Certificate in Investment Portfolios with Alternate Investments, 2022

- Venture Capital, Growth Equity, Distress Investing, Private Debt, Hedge Funds, Portfolio Construction.

Professional Experience

Polymathic Consulting, TX USA
Managing Director   **2011 - Present**
Founder and managing director of Polymathic Consulting, servicing clients ranging from early stage technology start-up endeavors to Fortune 100 and beyond. Clients turn to Polymathic for expansive, proven engineering, research and development, intellectual property and technical leadership to effectively advance their real world business needs.

IEEE and ACM Design Automation Conference, USA
Steering Committee
Conference Chair, Embedded Systems and Software Track   **2016 - Present**
Design Automation Conference is the premiere technical conference and trade show specializing in Hardware, Software, Internet of Things, Embedded Systems and related Design Methodologies. Conference chair, responsible for the review, critique, and acceptance of academia and industry based publications in the areas of embedded systems, embedded software, and embedded system design.

Rice University, TX USA
Adjunct Professor, Electrical and Computer Engineering   **2009 - Present**

Professor of Ph.D. candidate level courses in wireless telecommunications, embedded computing software, embedded computing hardware, and software/hardware optimization in modern computing systems utilizing modern high level programming languages. Advisor of senior and graduate student based projects revolving around multi-core heterogeneous systems as they pertain to wireless telecommunications, medical and video.

University of Texas, Austin, TX USA
Guest Lecturer, School of Engineering   **2021 - Present**
Guest lecturer in "Legal Issues and Technology Management", on subjects relating to technology, management, financial and fund raising matters, technology transfer, and certain legal issues. Students are primarily comprised of those with existing degrees, and a number of years of industry experience.

RISC-V Foundation, Berkeley, CA USA
Technical Committee   **2018 - Present**
RISC-V is an open CPU instruction set architecture (ISA) based on established reduced instruction set computing (RISC) principles. The RISC-V Foundation is a non-profit consortium chartered to standardize, protect, and promote the free and open RISC-V instruction set architecture together with its hardware and software ecosystem for use in all computing devices.

Freescale Semiconductor, TX USA
Chief Architect, Senior Member Technical Staff   **2009 - 2011**
Technical architect of Freescale's DSP compilers and related technology. Responsible for management of technology, engineering roadmaps, design lead on compiler infrastructure and optimizations (high level and low level), next generation ABI definitions and next generation architecture solutions. Technical lead on multi-year engagement with processor architects in design of next generation DSP cores. Developed software infrastructure for migrating OEM competitor software stacks to Freescale solutions, tools generation, software packages, migration strategies and white papers. Technical lead on Tier-1 OEM customer relationships, evaluations of 3rd party technologies for potential partnerships and acquisitions, led various university research collaborations on behalf of Freescale. Development and deployment of internal software engineering policies and practices.

Freescale Semiconductor, TX USA
Senior Compiler Engineer V
High Performance Compiler Design, Processor Architecture   **2007 - 2009**
Team leader on compiler engineering effort to provide intuitive, interactive end user experience for DSP compiler tool suite. Designed a framework to guide users in achieving highly optimized compiled VLIW code. Assembly listing reports for optimization failure advice, porting advice when migrating from competitor architectures, advice on code modifications for optimization enablement. Lead designer, engineering effort director, project planning and scoping, release schedule, and drafting of specification. Development of various compiler optimizations for VLIW processing as well as software emulation layers for running competitor software solutions on Freescale silicon.

Advising of next-gen DSP core architecture team in creating a highly orthogonal, compiler targetable multi-clustered VLIW based digital signal processor architecture. Work with future basestation architecture teams on designing next-gen basestation architecture for 4G LTE incorporating control and data plane processing with appropriate programming models.

Method Seven, MA USA
Technical Co-Founder
High Performance Software and Hardware Systems Architecture   **2006 - 2007**
Founded Method Seven, a financial engineering company applying biologically inspired machine learning to financial market analysis. Principal software systems architect and hardware systems architect for both research and deployment platforms. Led research and development of platform

for scans and overlays covering the NASDAQ, NYSE, and AMEX markets using proprietary technologies.

Texas Instruments, TX USA
Advanced Architecture and Chip Technologies
Microprocessor and Systems Architecture **2005**
System modelling and architectural exploration of Davinci^{TM}system-on-chip (SOC) architecture designed for embedded video processing. SystemC based simulation models of on–chip crossbars, bus arbitration and bridge technology, as well as on–chip and off–chip memory controllers within application specific heterogeneous SOC architectures.

Fulbright and Jaworski LLP, TX USA
Scientific Advisor, Intellectual Property
Electrical, Computer Engineering and Computer Science **2005 - 2007**
Intellectual property consultant and technology advisor on litigation and prosecution work including, but not limited to: CDMA2000 3G wireless standards, wireless communications systems, embedded computing, and large scale modular software systems. Reverse engineering of source code varying from VHDL to high level object oriented applications, as well at patent prosecution and litigation work.

Intel Corporation, CA USA
Microprocessor Research Labs
Compiler Engineering **2000**
Implemented speculative multi–threading support in Intel's IA–64 compiler. Developed new program analysis and back end code generation phases to support speculatively launching threads at runtime. Analyzed the performance potentials of SPEC95 benchmarks with respect to speculatively multi–threaded execution.

Rice University, TX USA
Computer Architecture and Circuit Design (Instructor) **2000 - 2003**
Graduate instructor of graduate and undergraduate curriculum in the areas of Electrical and Computer Engineering, specifically relating to Computer Architecture and Circuit Design. Advised student projects, instructed classes and led laboratory work.

Vicarious Visions, NY USA
Lead Software Engineer **1999**
Principal engineer on Activision's "AMF Extreme Bowling" for Nintendo's Color Gameboy gaming console. Developed PC based audio and graphics development tools suite for use with Color Gameboy game production. Coded innovative, highly optimized assembly routines for real time speech and full motion video on the console's limited Zilog Z80 processor resources.

Stratus Computer, MA USA
Hardware Engineering **1997 - 1998**
Debugged locked step CPU operation and memory management issues in Stratus' fault tolerant UNIX release 3.4. Qualified Hewlett Packard PA–8000 series CPU modules under Stratus' proprietary OS release, VOS 14.0, during alpha and beta test phases. Wrote C code and UNIX shell scripts for recreating documented system failures, and to automate remote kernel updates and OS installs as well as data logging.

Rensselaer Polytechnic Institute, NY USA
Digital Microelectronics Design (Instructor) **1997 - 1998**
Undergraduate instructor of undergraduate courses in digital microelectronics and circuit design. Instructed weekly lessons, computer design labs, graded exams and problem sets.

Rensselaer Electric Motor Sports, NY USA
Hardware and Software Engineering   **1995 - 1997**
This project was funded by, and led by, General Motors Corporation and Honda of America. Hardware and software co-design of embedded operating system and hardware platform for electrical vehicle prototypes, running on 16-bit Motorola 68K dual processor platform. Designed power engineering test platform for dynamometers, including hardware and user interface software.

Appointed Conference Committees and Organizations

IEEE International Conference on Communications, USA
Technical Review Committee, Machine Learning for Communications Track   **2021 - Present**
Technical committee member responsible for the review, critique, and acceptance of academia and industry based publications and research in the areas of machine learning for communications systems.

IEEE International Symposium on Circuits and Systems, USA
Technical Review Committee   **2021 - Present**
Technical committee member responsible for the review, critique, and acceptance of academia and industry based publications and research in the areas of computing, including energy aware systems, multicore processing, and adaptive computing.

IEEE and ACM Design Automation Conference, USA
Technical Steering Committee, Embedded Computing Track   **2019 - Present**
Technical Steering Committee member responsible for the review, critique, and acceptance of academia and industry based publications and research in the area of embedded computing and related systems, including embedded hardware, embedded software, firmware and tools.

IEEE and ACM Design Automation Conference, USA
Co-chair, Program Committee, Embedded Systems and Software Track   **2014 - 2019**
Co-chair and Program Committee member responsible for the review, critique, and acceptance of academia and industry based publications in the areas of embedded systems, embedded software, and embedded system design. Design Automation Conference is an annual technical conference and trade show specializing in electronic systems.

IEEE and ACM Design Automation Conference, USA
Program Committee, Designer and User Track   **2011 - Present**
Program Committee member responsible for the review, critique, and acceptance of academia and industry based publications in the areas of automated system design, both of hardware, software, and system analysis. Design Automation Conference is an annual technical conference and trade show specializing in electronic systems.

ACM Great Lakes Symposium on VLSI, Stresa-Lago Maggiore, Italy
Program Committee   **2007**
Reviewer and committee member in the area of system-on-chip architectures, VLSI design, and compiler driven architecture design space exploration.

IEEE International Symposium on Personal Indoor and Mobile Radio Communications, Helsinki, Finland
Program Committee   **2006**
Reviewer and committee member in the area of personal and mobile area radio communications and related systems.

ACM International Conference on Parallel Architectures and Compilation Techniques, Charlottesville, VA, USA
Program Committee   **2002**
Reviewer and committee member in the area of parallel computer architectures, programming lan-

guages and related compiler technologies.

Books and Contributed Chapters

Brogioli, Michael C., and Kraeling, Mark B., *Internet of Things - A Synopsis of the Internet of Things, its History, Application, Technology, Architecture, and Challenges Moving Forward*, Software Engineering for Embedded Systems - Methods, Practical Techniques and Applications, 2nd Edition, Elsevier Publishing, 2019.

Brogioli, Michael C., *Software and Compiler Optimization for Microcontrollers, Embedded Processors and DSPs*, Software Engineering for Embedded Systems - Methods, Practical Techniques and Applications, 2nd Edition, Elsevier Publishing, 2019.

Brogioli, Michael C., *Embedded and Multicore System Architecture - Design and Optimization*, Software Engineering for Embedded Systems - Methods, Practical Techniques and Applications, 2nd Edition, Elsevier Publishing, 2019.

Leotescu, Florin, and Cristian, Marius and Brogioli, Michael C., *Performance Analysis using NXP's i.MX RT1050 Crossover Processor and the Zephyr Real-Time Operating System*, Software Engineering for Embedded Systems - Methods, Practical Techniques and Applications, 2nd Edition, Elsevier Publishing, 2019.

Wu, Michael and Sun, Yang and Wang, Guohui and Brogioli, Michael C. and Cavallaro, J. R., *Implementation of a High Throughput 3GPP Turbo Decoder on GPU Architectures*, Software Development for Networking Applications – Expert Guides Series, Elsevier Publishing, Atlanta, GA, 2018.

Brogioli, M. C., *On The C++ Programming Language for Embedded Software, Systems, and Platforms*, Software Engineering for Embedded Systems – Expert Guides Series, Elsevier Publishing, Atlanta, GA, 2013.

Brogioli, M. C., *Software Optimizations for Memory Performance in Embedded Systems*, Software Engineering for Embedded Systems – Expert Guides Series, Elsevier Publishing, Atlanta, GA, 2013.

Invited Co-Author, *Signal Processing Systems Handbook, Second Edition*, Springer Publishing Company, 11 West 42nd Street, New York, NY, 2012.

Brogioli, M. C., *Software Programmable DSP Architectures*, Expert Guide DSP for Embedded and Real-Time Systems, pp. 63-75, Elsevier Publishing, Atlanta, GA, 2012.

Brogioli, M. C., *The DSP Hardware / Software Continuum*, Expert Guide DSP for Embedded and Real-Time Systems, pp. 103-113, Elsevier Publishing, Atlanta, GA, 2012.

Brogioli, M. C., *DSP Optimization - Memory Optimization*, Expert Guide DSP for Embedded and Real-Time Systems, pp. 217-241, Elsevier Publishing, Atlanta, GA, 2012.

Brogioli, M. C. and Dew, Stephen, *Optimizing DSP Software - High level Languages and Programming Models*, Expert Guide DSP for Embedded and Real-Time Systems, pp. 167-179, Elsevier Publishing, Atlanta, GA, 2012.

Sun, Yang, Amiri, Kiarash, Brogioli, Michael, Wang, Guohui, and Cavallaro, Joseph R., *DSP Hardware Accelerator Architectures for Communication Applications*, Springer Publishing, New York, NY, Spring 2012.

Sun, Yang, and Amiri, Kiarash, and Brogioli, Michael C., and Cavallaro, Joseph, *Application-Specific Accelerators for Communications*, Springer Publishing Company, 11 West 42nd Street, New York,

NY, 2010.

Invited Co-Author, *Signal Processing Systems Handbook, First Edition*, Springer Publishing Company, 11 West 42nd Street, New York, NY, 2010.

Publications and Invited Papers

Brogioli, Michael, C., and Games, William, and Moats, Richard, *Current and Future Challenges in Internet of Things (IoT) Development Silos (Part I)*, Embedded Computing Design Magazine, USA, 2020.

Brogioli, Michael, C., and Games, William, and Moats, Richard, *On Solving the IoT Development Silo Problem* IEEE Real-Time and Embedded Technology and Applications Symposium, Tools and Demos Session, Montreal, Canada, 2019.

Moats, Richard, and Games, Bill, and Brogioli, M. C., *Arch - A New Language For The Next Wave of Network-Connected Embedded Development*, Design Automation Conference, Austin, Texas, 2017.

Moats, Richard, and Games, Bill, and Brogioli, M. C., *Network Native - The Next Wave of Connected Embedded Development*, Network Native Inc., Austin, Texas, 2017.

Invited Paper, Arokia I, Brogioli, Michael, Jain, Nitjin and Garg, Umang, *LTE Layer 1 Software Design on Heterogeneous Multicore DSP Platforms*, IEEE 45th Asilomar Conference on Signals, Systems and Computers, Pacific Grove, CA, 2011.

Kyriakopoulous, Konstantinos, Brogioli, Michael C., and Zhang, Ruihao, *Improving Software Systems Quality through Well Defined Development Methodologies*, 2011 Test Methodology and Efficiency Symposium, Freescale Semiconductor, Austin, TX, USA, 2011.

Brogioli, Michael C., and Cavallaro, J.R., *Compiler Driven Architecture Design Space Exploration for Embedded DSP Workloads: A Study in Software Programmability Versus Hardware Acceleration*, IEEE 43rd Asilomar Conference on Signals, Systems and Computers, Pacific Grove, CA, 2009.

Brogioli, Michael C., and Zhang, Ruihao, *Compiler Feedback: Guiding Performance of Compiled C Code*, Freescale Semiconductor White Paper, Austin, TX, 2009.

Brogioli, M.C., and Cavallaro, J., *RISD: A Retargetable Compiler Infrastructure for Scalable Multi-Clustered VLIW DSP Architectures*, IEEE 5th Dallas Circuits and Systems Workshop, Dallas, TX, 2007.

Brogioli, Michael C., Radosavljevic, P., and Cavallaro, J., *A General Hardware/Software Codesign Methodology for Embedded Signal Processing and Multimedia Workloads*, IEEE 40th Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, 2006.

Brogioli, Michael C., Radosavljevic, P., and Cavallaro, J., *Hardware/Software Co-design Methodology for DSP/FPGA Partitioning: A Case Study for Meeting Real-Time Processing Deadlines in 3.5G Mobile Receivers*, 49th IEEE International Midwest Symposium on Circuits and Systems, San Juan, Puerto Rico, 2006.

Brogioli, Michael C., Willmann, P.D., and Rixner, S., *Parallelization Strategies for Network Interface Firmware*, IEEE/ACM 4th Annual Workshop on Optimizations for DSP and Embedded Systems (In Conjunction with IEEE/ACM International Symposium on Code Generation and Optimization), Manhattan, NY, 2006.

Brogioli, Michael C., Gadhiok, M., and Cavallaro, J., *Design and Analysis of Heterogeneous DSP/FPGA Based Architectures for 3GPP Wireless Systems*, IEEE Real-Time and Embedded Technology and

Applications Symposium Work-in-Progress Sessions, San Jose, CA, 2006.

Brogioli, Michael C., and Cavallaro, J., *Modelling Heterogeneous DSP-FPGA Based System Partitioning with Extensions to the Spinach Simulation Environment*, IEEE 39th Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, 2005.

Joseph R. Cavallaro, Michael C. Brogioli, Alexandre de Baynast, and Predrag, Radosavljevic, *Reconfigurable Architectures for Wireless Systems: Design Exploration and Integration Challenges*, Wireless World Research Forum, Toronto, CA, 2004.

Brogioli, Michael C., Pai, V.S., Willmann, P.D., *Spinach: A Liberty–Based Simulator For Programmable Network Interface Architectures*, ACM SIGPLAN/SIGBED Conference on Languages Compilers and Tools for Embedded Systems, San Diego, CA, 2004.

Brogioli, Michael C., *Dynamically Reconfigurable Data Caches in Low Power Computing*, Masters Thesis, Rice University, Houston Texas, 2002.

Brogioli, Michael C., and Jones, Bryan, *Dynamically Configurable Caches in Low Power Computing*, Internal White Paper, Rice University, Houston Texas, 2001.

Patents   Gregory D. Chiocco and Michael C. Brogioli, *Systems and Methods for Connected Computation in Network Constrained Systems*, U.S. Patent Application 18/242,483.

Gregory D. Chiocco and Michael C. Brogioli, *Systems and Methods for Obtaining Location Data*, U.S. Patent Application 18/807,970.

Gregory D. Chiocco and Michael C. Brogioli, *Systems and Methods for Aggregating Harvest Yield Data*, U.S. Patent No. 11,854,094.

Gregory D. Chiocco and Michael C. Brogioli, *Systems and Methods for Obtaining Location Data*, U.S. Patent No. 12,066,838.

Donald W. Games, Michael C. Brogioli Ph.D., Richard Moats, *System And Method for Holistic Application Development and Deployment in a Distributed Heterogeneous Computing Environment*, U.S. Patent Application 17/745,792, filed May 2022. Patent Pending.

Gregory D. Chiocco and Michael C. Brogioli, *Systems and Methods for Connected Computation in Network Contstrained Systems*, U.S. Patent No. 11,750,701.

Gregory D. Chiocco and Michael C. Brogioli, *Systems and Methods for Traversing A Three Dimensional Space*, U.S. Patent No. 11,526,180.

Gregory D. Chiocco and Michael C. Brogioli, *Systems and Methods for Aggregating Harvest Yield Data*, U.S. Patent No. 11,354,757.

Donald W. Games, Michael C. Brogioli Ph.D., Richard Moats, *System And Method for Holistic Application Development and Deployment in a Distributed Heterogeneous Computing Environment*, U.S. Patent No. 11,340,887.

Michael C. Brogioli, Ph.D., Cesar Taylor M.D., and Howard Roberts, *Location Agnostic Platform for Medical Condition Monitoring and Prediction and Method of Use Thereof*, Patent No: 147145.010100/US, 2014.

Cesar Taylor M.D., and Michael C. Brogioli Ph.D., and Howard Roberts, *System for Holistic Pain*

Monitoring and Prediction and Method of User Thereof, Patent No: 147145.010200/US, 2014.

Cesar Taylor M.D., and Michael C. Brogioli Ph.D., and Howard Roberts, *System for Prevention of Narcotic Diversion and Method of Use Thereof*, Patent No: 147145.010300/US, 2014.

Howard Roberts, Cesar Taylor M.D., and Michael C. Brogioli Ph.D., *Magnetometer Breathing Sensor and Method of User Thereof*, Patent No: 147145.010400/US, 2014.

Leadership and Board Membership	

Tandem Motion Company FL, USA
Advisory Board   **2021 - 2023**
Advisory board member on intellectual property strategy, fundraising, finance and select technologies. Tandem is building hybrid solutions for heavy duty internal combustion engine vehicles.

AgCompute CA USA
Advisory Board, Co-Inventor   **2019 - Present**
Advisory board and co-inventor of patent pending technology for the advancement of Agriculture Technology in areas of low network connectivity and adverse conditions. Innovative sensor, edge and cloud computing solutions for in-field real time asset management.

MIT MassChallenge USA
Mentor, Speaker   **2017 - Present**
MassChallenge is a global startup accelerator with a focus on high-impact, early-stage entrepreneurs. Through its global network of accelerators in Boston, London, Mexico City, Geneva, Jerusalem and Texas, coupled with unrivaled access to our corporate partners, MassChallenge has driven growth and created value the world over. To date, MassChallenge has raised over $2B in funding, generated over $900M in revenue, and created over 65,000 jobs.

ScribeSense, TX USA
Board of Directors   **2017**
ScribeSense is a *patented* cloud-based grading platform for schools and the only solution for grading free-form paper tests. ScribeSense automatically grades handwritten tests with 99% accuracy. Teachers scan and upload their own tests using a standard school scanner. ScribeSense's visual analytics enables data-driven decision making so schools can improve student learning and retain top teacher talent.

Southwest Angel Network for Social Impact, TX USA
Board of Directors   **2015 - 2019**
The Southwest Angel Network for Social Impact (SWAN Impact) is a community of like-minded investors who enjoy working together to *Make the world a better place, one company at a time.* We believe that we can have the most significant impact by funding for-profit start-up companies who are building sustainable businesses.

Network Native, TX USA
Board of Directors, Co-Founder, CTO   **2015 - Present**
Board member and co-inventor, advising in the areas of Internet of Things technologies, specifically related to product developer solutions, programming languages and platforms, security and infrastrucure. Business development, marketing, and fund raising. Have held various roles, including but not limited to CTO.

NewCrew, TX USA
Advisory Board   **2015 - 2016**
Board member advising in the areas of mobile computing, social computing, and geofencing technologies. Business development, marketing, and fund raising.

AngelSpan, TX USA

Advisory Board   **2015 - 2016**

Board member advising in the areas of professional investor relations to start-ups, resource allocation, and a platform for increased efficiency and valuation of early stage companies and venture capital portfolios.

Student Loan Genius (now Vault), TX USA

Advisory Board, Interim CTO   **2013 - 2014**

Advisory board member and interim CTO advising in the areas of financial transactions systems and enterprise software, as they pertain to solving the student loan debt crisis for early stage science, technology, engineering and medicine (STEM) employees. Technology, recruiting, fund raising. Vault was acquired by Summer PBC in 2024.

HealthBits, TX USA

Board Member, Co-Inventor   **2013 - 2014**

Board member advising in the areas of large scale enterprise software systems, real-time computing and medical sensing devices across complex event processing systems.

Osmek, TX USA

Interim CTO, Advisory Board   **2012 - 2014**

Interim CTO and board member advising in the areas of large scale cloud based content management software systems. Providing innovative media content management for heterogeneous web enabled devices with geolocational services, primarily using PHP and Python programming languages.

Academia   **Rice University**, Houston, Texas USA

DSP Compiler Design   **2005 - 2009**

Developed *RISD*, a retargetable compiler infrastructure for clustered VLIW DSP architectures. By taking pre-existing code schedules and binaries for existing DSP applications, RISD takes a flexible machine definition for which the code should be recompiled. Users can specify the number of VLIW clusters, functional units per VLIW cluster, functional unit mix per VLIW cluster, register file sizes, cluster interconnect topology (point-to-point versus 2d mesh network), multi-cluster scheduling algorithms, and inter-cluster cross-register file bandwidth and latencies.

Compiler framework was used to perform compiler driven design space exploration of massively multi-clustered VLIW based architectures versus FPGA and ASIP implementations of software kernels. RISD was used in studies comparing tradeoffs in computational throughput versus gates required to implement programmable DSP cores containing many register files and VLIW compute clusters, versus FPGA efficiency when including routing overhead for large scale problems.

Rice University, Houston, Texas USA

DSP/FPGA Based System-On-Chip Architectural Simulator Design   **2004 - 2009**

Developed *Spinach DSP-FPGA*, a modular and composable simulator design infrastructure for programmable and reconfigurable embedded SOC architectures. Designed and developed modular and composable software modules to bit-true, cycle accurately simulate Texas Instruments C62x and C64x DSPs and MIPS style processors. Additionally, designed and developed support for SRAM and DRAM style memories, heterogeneous memory systems, heterogeneous clock domains, as well as runtime reconfigurable Xilinx Virtex II based FPGA computing elements, cache and memory controllers, bus arbiters, and on-chip interconnect fabric.

System was validated against compiled code DSP firmware from Texas Instruments' Code Composer Studio running on the simulator versus actual hardware benchmarks. Simulation platform was used to investigate highly heterogeneous multi-processor DSP based SOC architectures containing one or more Xilinx style FPGA based hardware coprocessors. Studies in 3.5G wireless telecommunications as well as H.26x video processing were performed to gain insight into overall system bottlenecks,

hardware and software partitioning strategies, and tradeoffs of overall system design.

Rice University, Houston, Texas USA
Programmable Network Interface Architecture Simulator Design   **2002 - 2004**
National Science Foundation Grant Nos. CCF-0532448 and CNS-0532452
Developed *Spinach*, a simulator design toolset for modelling programmable network interface architectures. Spinach models system components common to all programmable environments (ALUs, control and data paths, register files, instruction processing), as well as components specific to embedded computing (software controlled SRAM scratchpad memory, hardware assists for DMA and medium access control). Spinach is a simulator design infrastructure, rather than a simulator per se. As such, the same underlying C code framework is used to model a uniprocessor Gigabit network interface, a multi-processor Gigabit network interface, or a 10 Gigabit multi-processor network interface with highly heterogeneous memory systems. Only a small number of lines of high level scripting language code is required to describe each of the various systems.

Spinach was validated by modeling the Tigon-2 programmable Ethernet controller by Alteon Websystems, running actual compiled code Ethernet processing firmware and by comparing the reported results to actual hardware benchmarks. Spinach was also used to obtain new insights into the performance of Gigabit and 10 Gigabit network interfaces both in terms of hardware architecture and firmware parallelization strategies. *Public Website: https://sourceforge.net/projects/spinach/*

Rice University, Houston, Texas USA
Software Engineering and Consulting   **2000**
Implemented instruction selection and register allocation optimizations in UHFFT, an adaptive and portable software library for the Fast Fourier Transform. Performed in depth analysis of register pressure, compiler generated spill code, memory hierarchy utilization, and instruction selection for non–trivially sized FFT matrices running on commercially available hardware platforms. Utilized reverse Cuthill–McKee technique to achieve near optimal computation orderings and minimize live data set sizes, as well as optimize register allocation and instruction selection phases of compilation.

Select Expert Witness, Consultant Engagements

BMW of North America LLC[*] v. Foras Technologies Ltd.
Finnegan, Henderson, Farabow, Garrett & Dunner, LLP, GA, USA
Expert Witness in Fault Tolerant Multiprocessor Systems   **2024 - Present**
Case Subject Matter - Fault tolerant recovery in multiprocessor system architectures.
Work Performed - Expert consulting, multiple IPR declarations (to date).

HL Klemove Corp.[*] v. Foras Technologies Ltd.
Arnold & Porter Kaye Scholar LLP, CA, USA
Expert Witness in Multiprocessor Systems   **2024 - Present**
Case Subject Matter - Fault tolerant recovery in multiprocessor system architectures.
Work Performed - Expert consulting, expert declarations (to date).

Labrador Diagnostics LLC[*] v. Biofire Diagnostics, LLC and Biomerieux, S.A.
Irell & Manella LLP, CA, USA
Expert Consulting in Medical Device Software and Systems   **2024 - Present**
Case Subject Matter - Consultant in medical testing equipement hardware, software and computer networking technology.
Work Performed - Expert consulting, reverse engineering, declarations (to date).

Mercedes-Benz USA, LLC v. Daedalus Prime LLC[*]
Ascenda Law Group, CA, USA
Expert Witness in Multicore Systems, Memory and Power Mgmt   **2024 - Present**
Case Subject Matter - Dynamic power management in heterogeneous CPU/GPU systems, interconnects and memory systems.

Work Performed - Expert consulting, five IPR declarations, five depositions (to date).

Samsung Electronics Co., LTD v. Headwater Research LLC*
Russ, August, and Kabat LLP, Los Angeles, CA, USA
Expert Witness in Computer Networking Technology 　　　　　**2024 - Present**
Case Subject Matter - Wireless/cellular networking technology as it relates to mobile devices and messaging.
Work Performed - Expert consulting, IPR declaration (to date).

Samsung Electronics Co., LTD v. Headwater Research LLC*
Russ, August, and Kabat LLP, Los Angeles, CA, USA
Expert Witness in Wireless Networking Technology 　　　　　**2024**
Case Subject Matter - Wireless networking technology as it relates to mobile devices and secure communication.
Work Performed - Expert consulting, IPR declaration.

SEVEN Networks, Inc.* v. Motolola Mobility LLC
McKool Smith LLP, NY, USA
Expert Witness in Mobile Device Power Management 　　　　　**2023 - 2024**
Case Subject Matter - Power management hardware and software systems in mobile devices.
Work Performed - Expert consulting, expert reports, deposition.

Viasat, Inc. v. Western Digital Techs., Inc*
Gibson, Dunn & Crutcher, LLP, CA, USA
Expert Witness in Comptuer Memory Technology 　　　　　**2023 - Present**
Case Subject Matter - Error correction technology for non-volatile memory.
Work Performed - Expert consulting (to date).

Valtrus Innovations LTD* v. AT&T Inc., et al
Reichman Jorgensen LLP, CA, USA
Expert Witness in Multiprocessor Systems and Caching Technology 　　**2023 - Present**
Case Subject Matter - Multiprocessor systems, dynamic cache partitioning and related technology.
Work Performed - Expert consulting (to date).

Valtrus Innovations LTD* v. SAP America, Inc. and SAP, SE
Reichman Jorgensen LLP, CA, USA
Expert Witness in Multiprocessor Systems and Caching Technology 　　**2023 - Present**
Case Subject Matter - Multiprocessor systems, caching and memory systems, and secure computing.
Work Performed - Expert consulting (to date).

BMW of North America LLC* and Robert Bosch LLC* v. Foras Technologies Ltd.
Finnegan, Henderson, Farabow, Garrett & Dunner, LLP, GA, USA
Expert Witness in Multiprocessor Systems 　　　　　**2023 - Present**
Case Subject Matter - Fault tolerant recovery in multiprocessor system architectures, including firmware related functionality.
Work Performed - Expert consulting, expert declarations (to date).

Sonrai Memory Limited* v. Micron Technology, Inc.
BC Law Group PC, NY, USA
Expert Witness in Volatile and Non-Volatile Memory Technology 　　**2023 - 2024**
Case Subject Matter - Expert Witness in volatile and non-volatile memory technology, including power systems.
Work Performed - Expert consulting, expert reports, depositions.

Micron Technology Inc. v. Sonrai Memory Limited[*]

BC Law Group PC, NY, USA

Expert Witness in Volatile and Non-Volatile Memory Technology   2023 - 2024

Case Subject Matter - Expert Witness in volatile and non-volatile memory technology, including power systems.

Work Performed - Expert consulting, multiple IPR declarations, multiple depositions.

AGIS Software Development, LLC[*] **v. Samsung Electronics Co., Ltd. et. al**

Fabricant LLP, NY, USA

Expert Witness in Mobile Devices and Systems   2023 - 2024

Case Subject Matter - Expert Witness in mobile devices and location tracking software and systems.

Work Performed - Expert consulting.

Samsung Electronics Co. Ltd. and Samsung Semiconductor, Inc. v. Netlist, Inc.[*]

Netlist, Inc.[*] **v. Google LLC, Alphabet Inc., Samsung Electronics Co., Ltd.**

and Samsung Semiconductor, Inc.

Irell & Manella LLP, CA, USA

Expert Witness in Computer Memory and Module Architecture   2023

Case Subject Matter - Expert Witness in computer memory module architecture, self testing, DRAM and related technologies.

Work Performed - Expert consulting, declarations, depositions.

Netlist, Inc.[*] **v. Micron Technology, Inc.; Micron Semiconductor Products, Inc.; Micron Technology Texas LLC**

Irell & Manella LLP, CA, USA

Expert Witness in Computer Memory and Module Architecture   2023 - Present

Case Subject Matter - Expert Witness in computer memory modules, high capacity HBM technology, and issues relating to performance and power.

Work Performed - Expert consulting, expert reports, depositions (to date).

Samsung Electronics Co., Ltd v. Netlist, Inc[*]

Irell & Manella LLP, CA, USA

Expert Witness in Computer Memory   2022 - 2023

Case Subject Matter - Expert Witness in multiple IPRs related to high bandwidth stacked memory architectures.

Work Performed - Expert consulting, IPR declarations, depositions.

Daedalus Prime LLC[*] **v. Samsung Electronics Co., Ltd. et. al**

Bluepeak Law Group LLP, NY, USA

Expert Witness in Dynamic Power Management   2023

Case Subject Matter - Dynamic power management of multicore processors, memory systems and related domains.

Work Performed - Expert consulting.

Certain Semiconductors and Devices and Products Containing the Same, Including Printed Circuit Boards, Automotive Parts, and Automobiles, Inv. No. 337-TA-1332

Daedalus Prime LLC[*]

Reichman Jorgensen LLP, CA, USA

Expert Witness in Dynamic Power Management   2022

Case Subject Matter - Dynamic power management of multicore processors, memory systems and related domains.

Work Performed - Expert consulting.

Definitive Holdings LLC v. Powerteq LLC[*]

Proskauer Rose LLP, NY, USA
Expert Witness in Automotive Software and Hardware   2022 - 2023
Case Subject Matter - Automotive engine control software, hardware and related technology.
Work Performed - Expert consulting, declarations.

Aire Technology Ltd.* v. Apple Inc.
Aire Technology Ltd.* v. Google LLC
Aire Technology Ltd.* v. Samsung Electronics Co., Ltd. et. al
Russ, August, and Kabat LLP, Los Angeles, CA, USA
Expert Witness in Computer Hardware Design   2022
Case Subject Matter - Computer hardware design as it relates to Near Field Communication.
Work Performed - Expert consulting, declarations, deposition testimony.

WSOU Investments, LLC* v. ZTE Corporation et. al
Kasowitz Benson Torres LLP, NY, USA
Expert Witness in Video and Telecommunications Computing   2022 - 2023
Case Subject Matter - Expert Witness in hardware and software design as it relates to video codec
technologies and telecommunications processing.
Work Performed - Expert consulting and expert declaration.

Robert Zeidman* v. Lindell Management LLC
Bailey Glasser LLP, Washington DC, USA
Expert Witness in Computer Software and Networking   2022 - 2023
Case Subject Matter - Expert Witness in computer software and networking as it pertains to voting
machines used in the United States 2020 Presidential Election.
Work Performed - Expert consulting, expert reports, testimony at hearing.

Netlist, Inc.* v. Samsung Electronics Co., Ltd. et. al
Irell & Manella LLP, CA, USA
Expert Witness in Computer Memory and Module Architecture   2022 - 2023
Case Subject Matter - Expert Witness in computer memory modules, high capacity HBM technology,
and issues relating to performance and power.
Work Performed - Expert consulting, expert reports, depositions, trial testimony.

Samsung Electronics Co., Ltd v. Netlist, Inc*
Irell & Manella LLP, CA, USA
Expert Witness in Computer Memory   2022 - 2023
Case Subject Matter - Expert Witness in multiple IPRs related to computer memory module archi-
tecture, including DRAM and related technologies.
Work Performed - Expert consulting, IPR declarations, depositions.

Scott and White Health Plan and SHA, LCC d/b/a FirstCare* v. Actian, Corporation
Germer, Beaman & Brown PLLC, TX, USA
Expert Witness in Computer Software   2022 - Present
Case Subject Matter - Expert Witness in computer software and related licensing and copyright
matters.
Work Performed - Expert consulting (to date).

Idan Bar-Asher et. al v. Playtika Holding Corp., et. al Ltd*
Labaton Sucharow LLP, Washington D.C., USA
Expert Witness in Mobile Software and Systems   2022 - 2024
Case Subject Matter - Expert witness in mobile gaming software and systems development as it
relates to federal securities laws and Initial Public Offerings (IPOs).
Work Performed - Expert consulting.

Maxell Ltd* **v. Lenovo Group Ltd., et. al**
Mayer Brown LLP, Washington D.C., USA
Expert Witness in Power Management   **2022 - 2023**
Case Subject Matter - Expert Witness in the area of mobile devices, microprocessors and power management.
Work Performed - Expert consulting.

Q Technologies, Inc.* **v. Walmart, Inc.**
Q Technologies, Inc.* **v. Neutron Holdings, Inc. d/b/a/ LIME**
Kane Russell Coleman & Logan PC, TX, USA
Expert Witness in Mobile Payments Systems   **2021 - 2024**
Case Subject Matter - Expert Witness in the area of mobile payments processing systems.
Work Performed - Expert consulting, infringement expert reports, depositions.

Samsung Electronics Co., Ltd v. Netlist, Inc*
Gibson Dunn & Crutcher LLP, CA, USA
Expert Witness in Computer Memory   **2021 - 2022**
Case Subject Matter - Expert Witness in computer memory module architecture, self testing, DRAM and related technologies.
Work Performed - Expert consulting, IPR declarations, depositions.

Sonrai Memory Limited* **v. Oracle Corporation**
Russ, August, and Kabat LLP, Los Angeles, CA, USA
Expert Witness in Memory and Compression Technology   **2021 - 2022**
Case Subject Matter - Memory controllers, memory technology and data compression technology.
Work Performed - Expert consulting, claim construction, declarations, depositions.

Certain Laptops, Desktops, Servers, Mobile Phones, Tablets, and Components Thereof, Inv. No. 337-TA-1280
Sonrai Memory Limited*
Russ, August, and Kabat LLP, Los Angeles, CA, USA
Expert Witness in Low Power Systems   **2021 - 2022**
Case Subject Matter - System on chips, operating systems and system components related power consumption in computing devices.
Work Performed - Expert consulting, claim construction declarations, expert reports, depositions.

Future Link Systems LLC* **v. Advanced Microdevices, Inc.**
Future Link Systems LLC* **v. Apple, Inc**
Future Link Systems LLC* **v. Broadcom, Inc; Broadcom Corp.**
Future Link Systems LLC* **v. Qualcomm, Inc.; Qualcomm Technologies**
Future Link Systems LLC* **v. Realtek Semiconductor Corp.**
Russ, August, and Kabat LLP, Los Angeles, CA, USA
Expert Witness in Circuit Design, Interconnects and Test   **2021 - 2022**
Case Subject Matter - Semiconductor circuit design and reuse, memory design and test, PCI Express and related interconnect technologies.
Work Performed - Expert consulting, claim construction, declarations, depositions.

Certain UMTS and LTE Cellular Communications Modules and Products and Products Containing the Same, Inv. No. 337-TA-1240
Philips RS North America LLC and Koninklijke Philips N.V.*
Foley & Lardner LLP, MA, USA
Expert Witness in Wireless Computing Technology   **2020 - 2021**
Case Subject Matter - Embedded computing technology related to wireless mobile devices, including 3GPP standards based functionality.

Work Performed - Expert consulting, expert reports, deposition, trial testimony.

Acqis* v. Samsung Electronics Co., LTD
Robins Kaplan LLP, USA
Expert Witness in Mobile Devices and Interconnects 2021
Case Subject Matter - Chip and chipset interconnect technology relating to mobile and non-mobile devices.
Work Performed - Expert consulting, expert reports, depositions.

Neodron Limited* v. Texas Instruments, Inc
Neodron Limited* v. Cypress Semiconductor Corp
Neodron Limited* v. Renesas Electronics Corp
Neodron Limited* v. ST Microelectronics N.V.
Russ, August, and Kabat LLP, Los Angeles, CA, USA
Expert Witness in Touch Screen Technology and Related Systems 2020 - 2021
Case Subject Matter - Expert witness in hardware/software systems for touch screen technology, including analog and digital signaling and processing.
Work Performed - Expert consulting, declarations.

Qualcomm Inc. v. Monterey Research LLC*
Desmarais LLP, NY, USA
Expert Witness in Memory Systems Technology 2021
Case Subject Matter - SRAM and DRAM technology, memory system burst functionality and related matters.
Work Performed - Expert consulting, IPR declarations, depositions.

Advanced Micro Devices Inc. v. Monterey Research LLC*
Desmarais LLP, NY, USA
Expert Witness in Memory Systems, Interconnects 2021
Case Subject Matter - SRAM and DRAM technology, multi-ported memory systems, boot technology and related technologies.
Work Performed - Expert consulting, IPR declarations, depositions.

Analog Devices Inc. v. Xilinx Inc.*
Morrison & Foerster LLP, CA, USA
Expert Witness in FPGAs and Configurable Computing 2020 - 2021
Case Subject Matter - FPGAs and solutions related to crossbar interconnects, high speed transceivers, and configurable computing.
Work Performed - Expert consulting, IPR declarations, depositions.

TriOptima AB v. Quantile Technologies Limited*
Caldwalader Wickersham & Taft, New York, USA
Expert Witness in Source Code for FinTech Systems 2020
Case Subject Matter - Software technology implementations of financial services related to compression and derivatives markets.
Work Performed - Expert consulting, source code review.

Unified Patents LLC v. JustService.net LLC*
Sheridan Ross P.C., Colorado, USA
Expert Witness in Virtual Data Storage Systems 2020 - 2021
Case Subject Matter - Web enabled virtual data storage systems for backup, storing and transferring of data.
Work Performed - Expert consulting, declarations, depositions.

Karya Property Management, LLC* v. ResMan, LLC
Baker Botts LLP, Houston, Texas, USA
Expert Witness in Distributed Software Systems   **2020 - 2021**
Case Subject Matter - Expert witness in the areas of distributed software systems, including data base technologies, as they relate to property management software and related systems.
Work Performed - Expert consulting, claim construction, IPR declarations, CBM declarations, depositions, expert reports.

Certain Touch-Controlled Mobile Devices, Computers, and Components Thereof, Inv. No. 337-TA-1193
Neodron Limited*
Russ, August, and Kabat LLP, Los Angeles, CA, USA
Expert Witness in Touch Screen Technology and Related Systems   **2020**
Case Subject Matter - Expert witness in hardware/software systems for touch screen technology in mobile devices.
Work Performed - Expert consulting.

VLSI Technology LLC* v. Intel Corporation
Irell & Manella LLP, Los Angeles, CA USA
Expert Witness in Computer Architecture   **2020 - 2021**
Case Subject Matter - Expert witness in the area of computer architecture, microprocessors and power management.
Work Performed - Expert consulting and source code review, expert reports, depositions, trial testimony.

Optimum Imaging Technologies LLC* v. Canon Inc.
Ruyak Cherian LLP, Washington D.C., USA
Expert Witness in FPGA Based Image Processing Systems   **2019 - 2021**
Case Subject Matter - Expert witness and consultant in the area of heterogeneous FPGA/DSP/CPU based systems as applied to image and video processing technology.
Work Performed - Expert consulting, claim construction declarations, expert reports, depositions, IPR declarations.

Dish Network, LLC v. Contemporary Display LLC*
Toler Law Group, P.C., Texas., USA
Expert Witness in Real Time Video Processing   **2020**
Case Subject Matter - Expert Witness in real-time video processing technology over the Internet, including related user interfaces and quality of service.
Work Performed - Consulting, IPR declarations, deposition.

Dish Network, LLC v. Contemporary Display LLC*
Toler Law Group, P.C., Texas., USA
Expert Witness in Real Time Video Processing   **2020**
Case Subject Matter - Expert Witness in real-time video processing technology over Internet, including related user interfaces and quality of service.
Work Performed - Consulting, IPR declarations, deposition.

Multimedia Content Management LLC* v. Dish Network LLC
Sheridan Ross P.C., Colorado, USA
Expert Witness in Real Time Video Processing   **2019 - 2020**
Case Subject Matter - Expert Witness in Internet based real-time video processing set top boxes, and related content processing and distribution.
Work Performed - Expert consulting.

Exegy Inc. et al v. ACTIV Financial Systems, Inc.[*]
Wolf Greenfield & Sachs P.C., USA
Expert Witness High Speed Computing for Financial Services   **2019 - 2021**
Case Subject Matter - Expert Witness in microprocessor and FPGA based system design for high speed financial services, high speed RDMA systems, and related technology.
Work Performed - Expert consulting, IPR declarations, depositions.

Certain Touch-Controlled Mobile Devices, Computers, and Components Thereof, Inv. No. 337-TA-1162
Neodron Limited[*]
Russ, August, and Kabat LLP, Los Angeles, CA, USA
Expert Witness in Touch Screen Technology and Related Systems   **2019 - 2020**
Case Subject Matter - Expert witness in hardware/software systems for touch screen technology in mobile devices.
Work Performed - Expert consulting, claim construction declaration, expert reports, depositions.

Maxell, Ltd., et al.,[*] **v. Apple Inc.**
Mayer Brown LLP, Washington D.C., USA
Expert Witness in Embedded Computer Architecture   **2019 - 2021**
Case Subject Matter - Expert witness and consulting engineer in low power computing and power management.
Work Performed - Expert consulting, claim construction declaration, claim construction deposition, expert reports, infringement and validity depositions.

Nuvoton Technology Corporation[*] **v. Microchip Technology Inc.**
Finnegan, Henderson, Farabow, Garrett & Dunner, Washington D.C., USA
Expert Witness in Embedded Computer Architecture   **2019 - 2020**
Case Subject Matter - Expert witness in embedded memory system hardware, direct memory access engines, memory controllers, and analog/digital and digital/analog ASICs.
Work Performed - Expert consulting, declarations, claim construction deposition, IPR declarations, deposition.

Shuttlewagon Inc.[*]**, v. Innovative Quality Solutions, LLC**
Stroz Friedberg, Massachusetts, USA
Expert Witness in Embedded Computing   **2019**
Case Subject Matter - Expert witness in Programmable Logic Controllers (PLCs), IEC 61131 IE / CodeSys and real-time computing as it pertains to industrial equipment, as well as misappropriation of proprietary technology.
Work Performed - Expert consulting.

RDM, Inc. v. Citoc Inc.[*]
Citoc Incorporated, Texas, USA
Expert Witness in Cloud / Web Based Computing   **2019**
Case Subject Matter - Expert witness cloud deployed, web based, infrastructure management software and software solutions deployment. Work Performed - Expert consulting.

ResMan, LLC v. Karya Property Management, LLC et al.[*]
Beck Redden LLP, Texas, USA
Expert Witness in Software Design   **2019 - 2021**
Case Subject Matter - Expert witness in trade secret matters related to design and architecture of consumer facing software products.
Work Performed - Expert consulting, expert reports, depositions, trial testimony.

Qualcomm[*] **v. Apple Inc.**

Case No. 3:17-cv-02398-DMS-MDD
Quinn Emanuel Urquhart & Sullivan, CA, USA
Expert Witness in Mobile Devices and Computer Architecture   **2019**
Case Subject Matter - Expert witness in mobile devices, computer architecture, and software system design for wireless communications.
Work Performed - Expert consulting.

Vasu Networks Corporation[*]
Skiermont Derby, Texas, USA
Consulting Expert in Cellular Network Technologies   **2019**
Case Subject Matter - Consulting expert in matters related to Single Radio Voice Call Continuity, Dual Radio Voice Call Continuity, and various heterogeneous wireless technologies and standards committees related to seamless connectivity.
Work Performed - Consulting expert.

Qualcomm[*] v. Apple Inc.
Case No. 37-2017-00041389-CU-BC-NC
Quinn Emanuel Urquhart & Sullivan, CA, USA
Expert Witness in Mobile Devices and Computer Architecture   **2018 - 2019**
Case Subject Matter - Expert witness in mobile devices, computer architecture, and software system design for wireless communications.
Work Performed - Expert consulting.

Qualcomm[*] v. Apple Inc.
Inv No. 337-TA-1093
Quinn Emanuel Urquhart & Sullivan, CA, USA
Expert Witness in Mobile Devices and Computer Architecture   **2017 - 2018**
Case Subject Matter - Expert witness in mobile devices, computer architecture, and software system design for wireless communications.
Work Performed - Expert consulting, expert reports, depositions, trial testimony.

Qualcomm[*] v. Apple Inc.
Quinn Emanuel Urquhart & Sullivan, CA, USA
Case No. 3:17-CV-1375-DMS-MDD
Expert Witness in Mobile Devices and Computer Architecture   **2018 - 2019**
Case Subject Matter - Expert witness in wireless mobile devices, computer architecture, and software system design.
Work Performed - Expert consulting, expert reports, depositions, trial testimony.

Redzone Wireless LLC v. Netgear Inc.[*]
Bird Marella, CA, USA
Expert Witness in Wireless Hardware/Software Systems   **2018 - 2019**
Case Subject Matter - Manufacturing of software and hardware used in wireless routers and base stations, including chipsets and software solutions.
Work Performed - Expert consulting, expert reports, depositions.

Nvidia[*] v. ZiiLabs Corporation
Quinn Emanuel Urquhart & Sullivan, NY, USA
Expert Witness in GPU Architecture, Computer Architecture   **2018**
Case Subject Matter - Expert witness in the areas of Graphics Processor (GPU) architectures, memory systems architectures, and microprocessor design.
Work Performed - Expert consulting.

Acqis* v. EMC Corporation
Cooley LLP, CA, USA
Expert Witness in Computer Architecture   2017 - 2018
Case Subject Matter - Expert witness in the areas of PCI, PCI-Express, system-on-chip technology, and computer memory technologies.
Work Performed - Expert consulting.

Qualcomm* v. Apple Inc.
Certain Mobile Electronic Devices and Radio Frequency and Processing Components Thereof, Inv No. 337-TA-1065
Quinn Emanuel Urquhart & Sullivan, CA, USA
Expert Witness in Mobile Devices and Computer Architecture   2017 - 2018
Case Subject Matter - Expert witness in mobile devices, computer architecture, and software system design.
Work Performed - Expert consulting, expert reports, depositions.

Network Management Solutions* v. AT&T Mobility et. al
IP Law Leaders, Washington DC, USA
Expert Witness in Cellular Network Management   2017
Case Subject Matter - Expert witness in mobile devices, wireless technology, 3GPP standards, and alarm management.
Work Performed - Expert consulting.

Certain Memory Modules and Components Thereof, and Products Containing Same, Investigation No. 337-TA-1023
Netlist* v. S.K. Hynix
Mintz Levin Cohn Ferris Glovsky and Popeo PC, Boston, MA, USA
Expert Witness in Computer Architecture and Memory Systems   2016 - 2017
Case Subject Matter - Expert witness in the area of JEDEC standards essential DRAM memory module technology, relating to DIMM, R-DIMM and LR-DIMM as it applies to server based computing.
Work Performed - Expert consulting, source code review, declarations, expert reports, depositions, ITC trial testimony.

Certain Audio Processing Hardware, Software, and Products Containing Same, Inv. No. 337-TA-1026
Andrea Electronics Corporation*
Pepper Hamilton, LLP, Washington, DC, USA
Expert Witness in Audio Processing Hardware and Software   2017
Case Subject Matter - Expert witness in hardware/software based digital signal processing systems audio processing and noise cancellation technology.
Work Performed - Expert consulting.

Specialized Monitoring Solutions, LLC v. Lutron Electronics Co., Inc.*
Vinson & Elkins LLP, Texas USA
Expert Witness in Embedded and Distributed Software Systems   2017
Case Subject Matter - Expert witness in embedded software and hardware systems, as well as distributed data storage and sensing.
Work Performed - Expert consulting.

Huawei Technologies Co., Ltd.*, v. Samsung Electronics America, Inc. et al
Sidley Austin LLP, California USA
Expert Witness in 4G and Legacy Cellular Technologies   2016 - 2017
Case Subject Matter - Expert witness in 4G and legacy cellular technologies.

Work Performed - Expert consulting, affidavits, claim construction.

Godo Kaisha IP Bridge 1[*] **v. Broadcom Limited et. al**
Ropes & Gray LLP, New York USA
Expert Witness in Computer Architecture   2016 - 2017
Case Subject Matter - Consultant in the area of ARM based embedded computing architecture and system on-chip technology. Reverse engineering of VHDL, Verilog and RTL based technologies, as it pertains to multicore system architectures.
Work Performed - Expert consulting, source code review, claim construction.

Huawei Technologies Co. Ltd.[*] **v. T-Mobile US, Inc. and T-Mobile USA, Inc.**
Fish & Richardson P.C., Texas USA
Expert Witness in 4G and Legacy Cellular Technologies   2016 - 2017
Case Subject Matter - Expert witness in 4G and legacy cellular technologies.
Work Performed - Expert consulting, claim construction, affidavits.

ACI Worldwide Corp. v. Mastercard International Incorporated[*]
Armstrong Teasdale LLP, Missouri, USA
Expert witness regarding financial transaction systems   2016 - 2017
Case Subject Matter - Expert witness in trade secret misappropriation as it pertains to middleware message passing systems and financial transaction networks.
Work Performed - Expert consulting, source code review, declarations, expert reports, depositions.

Sony Computer Entertainment America v. Rothschild Digital Media Innovations[*]
Carey Rodriguez Milian Gonya, LLP, Florida, USA
Expert witness regarding distributed multimedia systems   2016
Case Subject Matter - Expert witness in the area of distributed computing systems and multimedia technologies.
Work Performed - Expert consulting, declarations, expert reports, depositions.

DTS, Inc., et al. v. Nero AG, et al.[*]
Glaser Weil Fink Jacobs Howard Avchen & Shapiro, Los Angeles CA, USA
Expert witness regarding distributed multimedia systems   2016
Case Subject Matter - Expert witness in the area of software solutions for audio and video codecs.
Work Performed - Expert consulting, source code review, experimental analysis, expert reports, depositions.

Advanced Silicon Technologies[*]
Mintz Levin Cohn Ferris Glovsky and Popeo PC, Boston, MA, USA
Expert Consultant in Microprocessor Architecture, Intellectual Property 2015 - 2016
Case Subject Matter - Consultant in the area of computer architecture and microprocessor technologies, specifically related to memory systems.
Work Performed - Expert consulting.

Certain Audio Processing Hardware and Software and Products Containing the Same, ITC Inv. No. 337-TA-949
Lenovo (United States), Inc.[*]
Toshiba Corp
Akin Gump Strauss Hauer & Feld LLP, Philadelphia, PA, USA
Expert Witness in Digital Signal Processing, Intellectual Property   2015 - 2016
Case Subject Matter - Expert witness in hardware/software based digital signal processing systems tailored for noise cancellation technology.
Work Performed - Expert consulting, source code review, claim construction, expert reports, deposition.

Intel Corporation v. Future Link Systems*
Irell & Manella LLP, Los Angeles, CA USA
Expert Witness in Computer Architecture   2015 - 2018
Case Subject Matter - Expert witness in the areas of PCI, PCI-Express, system-on-chip technology, and computer memory technologies.
Work Performed - Expert consulting, source code review, declarations, expert reports, deposition.

Advanced Touchscreen and Gesture Technologies, LLC* v. Samsung Electronics, America, Inc., et al.
Robins Kaplan LLP, Intellectual Property, Minnesota, USA
Expert Witness in Mobile Devices and User Interfaces   2015 - 2017
Case Subject Matter - Expert witness in the analysis and reverse engineering of software systems pertaining to mobile devices, and human computer interfaces.
Work Performed - Expert consulting, declarations, expert reports.

Intellectual Ventures* v. Ericsson et al.
Dechert LLP, Los Angeles, CA, USA
Expert Witness in 3GPP standards and LTE Technologies, Intellectual Property 2014 - 2016
Case Subject Matter - Expert witness in 3GPP standards as they pertain to LTE cellular communications networks, in addition to system hardware and software design.
Work Performed - Expert consulting, source code review, declarations, claim construction, tutorials.

Papst Licensing GMBH & Co. KG.*
DiNovo & Price Ellwanger Hardy, Austin, TX USA
Expert Witness in FPGA Technologies, Intellectual Property   2014 - 2016
Case Subject Matter - Consultant in FPGA computing platforms and design flow processes, prior art, and infringement analysis.
Work Performed - Expert consulting, claim construction.

Locata LBS* v. Paypal Inc., et al.
Glaser Weil Fink Jacobs Howard Avchen & Shapiro, Los Angeles, CA, USA
Expert Witness in Geofencing Systems, Intellectual Property   2014 - 2015
Case Subject Matter - Expert witness in geofencing technology, geolocational technology, and systems architecture as it pertains to mobile cellular telecommunications and enterprise software systems.
Work Performed - Expert consulting, claim construction, expert reports, deposition testimony.

Cell and Network Selection LLC v. ZTE*
Pillsbury, Winthrop Shaw & Pittman, San Diego, CA, USA
Expert Witness in 3G/4G Cellular Technology, Intellectual Property   2014 - 2015
Case Subject Matter - Expert witness in technology pertaining to 3G, 3.5G, 3.75G and 4G wireless handset technology.
Work Performed - Expert consulting, claim construction, expert reports, deposition testimony.

CA Inc. D/B/A CA Technologies* v. AppDynamics, Inc.
Bracewell & Giuliani, Houston, TX, USA
Holland & Knight, Boston MA USA
Expert Witness in Enterprise Software Monitoring, Intellectual Property 2014 - 2015
Case Subject Matter - Expert witness in technology pertaining to dynamic runtime profiling of distributed software applications, specifically around Java and .NET technologies.
Work Performed - Expert consulting, source code review, declarations, expert reports, deposition testimony.

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M Seven System Limited v. Leap Wireless International, Inc.* et al.
Glaser Weil Fink Jacobs Howard Avchen & Shapiro, Los Angeles, CA, USA
Expert Witness in 3G/4G Feature Phone Software Systems, Intellectual Property 2014
Case Subject Matter - Expert witness in the area of mobile telecommunications technology, particularly cellular handset hardware and software design.
Work Performed - Expert consulting, source code review.

Lunareye v. Passtime*.
Conley Rose, P.C., Austin, TX, USA
Expert Witness in GPS Tracking Solutions 2014
Case Subject Matter - Expert witness in the area of mobile GPS tracking solutions software and hardware systems.
Work Performed - Expert consulting.

Certain Wireless Devices With 3G and/or 4G Capabilities and Components Thereof, ITC Inv. No. 337-TA-868
Interdigital, Inc.*
Wilson, Sonsini, Goodrich & Rosati LLP, Austin, TX, USA
Expert Witness in 3G/4G Cellular Technology, Intellecutal Property 2013 - 2015
Case Subject Matter - Expert witness in software systems and hardware systems, as they pertain to 3G/4G cellular communications and standards.
Work Performed - Expert consulting, source code review, claim construction, declarations, expert report, depositions, ITC trial testimony.

Investment Technology Group* v. United States Internal Revenue Services
Expert Witness in Financial Services Technology 2013
Case Subject Matter - Expert witness in the area of high performance software systems targeting financial market services.
Work Performed - Expert consulting, source code review, declarations, depositions, testimony at hearing.

Carrier Corporation v. Goodman Manufacturing*, et al.
Baker Botts LLP, Houston, TX USA
Expert Witness in Software and Hardware Systems, Intellectual Property 2013 - 2014
Case Subject Matter - Expert witness in the area of microprocessor based, serial distributed communications systems.
Work Performed - Expert consulting, source code review.

Gametek LLC* v. Facebook Inc. et al.
Collins, Edmonds, Porgorzelski, Schlather & Tower PLLC, Houston, TX USA
Expert Witness in Mobile Gaming Technologies, Intellectual Property 2013
Case Subject Matter - Expert witness in internet based client-server software systems for mobile and web browser based gaming technology.
Work Performed - Expert consulting, source code review.

Ultimate Pointer LLC* v. Nintendo Co. LTD et al.
Conley Rose P.C., Houston, TX USA
Expert Witness in Console Based Video Game Technology, Intellectual Property 2013 - 2015
Case Subject Matter - Expert witness in hardware and software systems for console based video game technology.
Work Performed - Expert consulting, source code review, declarations, expert reports, deposition testimony.

Alliantgroup, L.P. v. Tax Point Advisors[*]
Jeffrey Feingold and Tax Point Advisors, Houston, TX USA
Expert Witness in Internet Technology   **2013**
Case Subject Matter - Expert witness in IP based internet technology, packet spoofing and information systems.
Work Performed - Expert consulting, declarations.

Kerry T. Thibodeaux, M.D. v. American Lifecare Inc.[*]
Cox, Cox Filo, Camel & Wilson, Lake Charles, LA USA
Expert Witness in Medical Software Systems   **2013**
Case Subject Matter - Expert witness in medical billing and expense recording enterprise software systems.
Work Performed - Expert consulting.

Opelousas General Hospital Authority et al v. Fairpay Solutions Inc[*]
Cox, Cox Filo, Camel & Wilson, Lake Charles, LA USA
Expert Witness in Medical Software Systems   **2013**
Case Subject Matter - Expert witness in medical billing and expense recording enterprise software systems.
Work Performed - Expert consulting.

Wi-LAN USA, Inc. and Wi-LAN, Inc.[*] **v. Alcatel-Lucent USA Inc.**
Vinson Elkins LLP, Dallas, TX USA
Expert Witness in 3GPP LTE Technology, Intellectual Property   **2012 - 2013**
Case Subject Matter - Reverse engineering, analysis and education of counsel in the 3GPP LTE specification, and related software and hardware systems.
Work Performed - Expert consulting, source code review, claim construction, expert declarations.

Wi-LAN USA, Inc. and Wi-LAN, Inc.[*] **v. Ericsson Inc., and Telefonaktiebolaget LM Ericsson**
Vinson Elkins LLP, Dallas, TX USA
Expert Witness in 3GPP LTE Technology, Intellectual Property   **2012 - 2013**
Case Subject Matter - Reverse engineering, analysis and education of counsel in the 3GPP LTE specification, and related software and hardware systems.
Work Performed - Expert consulting, source code review, claim construction, expert declarations.

E-Contact Technologies, LLC v. Dell Inc.[*]**, et al.**
Baker Botts LLP, Houston, TX USA
Expert Witness in Mobile Operating Systems, Intellectual Property   **2012**
Case Subject Matter - Reverse engineering and analysis of the Android operating system as it pertained to mobile and tablet computing devices. Source code reverse engineering, system architecture and related analysis.
Work Performed - Expert consulting, source code review.

CheckFree Corporation* and CashEdge, Inc.* v. Metavante Corporation and Fidelity National Information Services, Inc.
Paul, Weiss, Rifkind, Wharton & Garrison LLP, New York, NY USA
Expert Witness in Banking and Billing Software Systems, Intellectual Property   **2012**
Case Subject Matter - Software systems analysis and reverse engineering of large scale software based financial billing systems. Source code reverse engineering, claim chart generation, expert report generation and testimony.
Work Performed - Expert consulting, source code review.

Realtime Data, LLC v. NASDAQ[*]**, Chase Bank**[*]**, Goldman Sachs**[*] **et al.**

Proskauer Rose LLP, New York, NY USA
Expert Witness High Performance Software Systems, Intellectual Property   2012
Case Subject Matter - Expert witness for joint defense counsel in the matter of large scale high frequency financial data aggregation platforms.
Work Performed - Expert consulting, claim construction, technical tutorials, declaration, expert reports, deposition testimony.

Realtime Data, LLC v. Thomson Reuters[*] et al.
Vinson & Elkins LLP, Austin, TX USA
Consultant in High Performance Software Systems, Intellectual Property 2011 - 2012
Case Subject Matter - Expert witness for joint defense counsel in the matter of large scale high frequency financial data aggregation platforms.
Work Performed - Expert consulting, claim construction, technical tutorials, declaration, expert reports, deposition testimony.

General Electric Co.[*] v. Mitsubishi Heavy Industries Ltd.
Weil, Gotshal & Manges LLP, Dallas, TX USA
Expert Witness in Hardware/Software Analysis, Intellectual Property   2010 - 2011
Case Subject Matter - Reverse engineering of real-time embedded system software source code and hardware system architecture pertaining to variable speed wind turbines and FPGA based sub-systems.
Work Performed - Expert consulting, declarations, source code review.

Atlantic Specialty Insurance et al v. AE Outfitters Retail Company[*], et al
Smith Mazure Director Wilkins Young & Yagerman, P.C., NY USA
Expert Witness in Embedded Hardware/Software Systems   2011
Case Subject Matter - Hardware and software system analysis of real-time networked embedded computing systems as it pertains to fire alarm infrastructure and fault handling.
Work Performed - Expert consulting, technical tutorial, expert declarations.

Gamestop[*], Inc v. Bexar Appraisal
Brusniak and Blackwell PC, Dallas, TX USA
Expert Witness in Software Analysis, Intellectual Property Litigation   2011
Case Subject Matter - Expert witness on the tangibility of software as it pertains to embedded computing, networking, and gaming platforms.
Work Performed - Expert consulting, expert declarations.

Quality Analytic Systems, Inc. v. Zebec Data Systems[*]
Rymer, Moore, Jackson & Echols, P.C., Houston, TX USA
Expert Witness in Software Systems   2011
Case Subject Matter - Reverse engineering and software analysis of enterprise level internet based medical billing software systems.
Work Performed - Expert consulting, source code review, declarations, arbitration.

Passlogix, Inc. v. 2FA Inc.[*]
Expert Witness in Smart Card Middleware Solutions, Trade Secret Exposure   2010
Case Subject Matter - Trade secret analysis of software and systems architecture as it pertains to optimal selection of smart card middleware solutions on a given computer system.
Work Performed - Expert consulting, expert declarations.

Terra Nova Sciences[*]. v. JOA Oil and Gas, B. V. et al.
Abraham & Watkins et al. LLP, Houston, TX USA
Expert Witness in Software Systems, Intellectual Property Litigation   2010
Case Subject Matter - Expert software analyst of algorithms and geomechanics modeling systems

as they pertain to oil well reservoirs.
Work Performed - Expert consulting, source code review.

Paltalk Holdings, Inc.* v. Sony Computer Entertainment America Inc. et al.
Heim Payne & Chorush LLP, Houston, TX USA
Software Analysis Expert, Intellectual Property Litigation **2010**
Case Subject Matter - Reverse engineering of internet based client-server video game console and server software architecture.
Work Performed - Expert consulting, source code review, infringement analysis.

Technomedia International, Inc.* v. International Training Services, Inc., et al.
Bracewell & Giuliani, LLP, Houston, TX USA
Expert Witness in Software Analysis, Contract Dispute **2010**
Case Subject Matter - Web enabled teaching materials as it pertains to oil well drilling. Analysis of internet based audio and video content delivery mechanisms and related website architecture.
Work Performed - Expert consulting, expert reports.

Gamestop, Inc* v. Bexar Appraisal
Brusniak and Blackwell PC, Dallas, TX USA
Expert Witness in Software Analysis, Tax Dispute **2009 - 2010**
Case Subject Matter - On the tangibility of software as it pertains to embedded computing, networking, and gaming platforms.
Work Performed - Expert consulting, expert reports.

Whetstone Electronics, LLC* v. Epson America, et al.
DiNovo & Price Ellwanger Hardy, Austin, TX USA
Expert Witness in System Analysis, Intellectual Property Litigation **2009 - 2011**
Case Subject Matter - Embedded computing systems pertaining to printer technology and computer hardware acceleration (microprocessors, DSP, FPGA and CPLD).
Work Performed - Expert consulting.

Whetstone Electronics, LLC* v. Xerox Corporation, et al
DiNovo & Price Ellwanger Hardy, Austin, TX USA
Expert Witness in System Analysis, Intellectual Property Litigation **2009 - 2011**
Case Subject Matter - Embedded computing systems pertaining to printer technology and computer hardware acceleration (microprocessors, DSP, FPGA and CPLD).
Work Performed - Expert consulting.

General Electric, Inc.* v. Mitsubishi Heavy Industries, Inc.
Vinson & Elkins LLP, Austin, TX USA
Expert Witness in Hardware and Software Analysis, Intellectual Property **2008 - 2009**
Case Subject Matter - Real time embedded computing and hardware/software designs for variable speed wind turbines, including digital signal processing DSP and FPGA based subsystems.
Work Performed - Expert consulting, source code review, technical tutorials, declarations, expert reports, depositions, ITC trial preparation.

Paltalk Holdings, Inc.* v. Microsoft Corporation
Heim Payne & Chorush LLP, Houston, TX USA
Technical Expert, Intellectual Property Litigation **2007 - 2008**
Case Subject Matter - Internet based client server console gaming architecture for real time experience.
Work Performed - Expert consulting, source code review, technical tutorials.

SuperSpeed Software, LLC* v. IBM Corporation

Heim Payne & Chorush LLP, Houston, TX USA
Technical Expert in Software Analysis, Intellectual Property Litigation   **2007 - 2008**
Case Subject Matter - Computer database technology, parallel file systems and clustered computing.
Work Performed - Expert consulting, technical tutorial, source code review.

QPSX Developments 5 Pty Ltd.* v. Juniper Networks, Inc.
Fulbright and Jaworski LLP, Houston, TX USA
Technical Consultant, Intellectual Property Litigation   **2006 - 2007**
Case Subject Matter - Data transmission algorithms for computer networks.
Work Performed - Consulting, claim construction, claim chart preparation, technical tutorials.

Commonwealth Scientific and Indus. Research Org.* v. Buffalo Tech. Inc.
Fulbright and Jaworski LLP, Houston, TX USA
Technical Consultant, Intellectual Property Litigation   **2006 - 2007**
Case Subject Matter - High speed data rate network for wireless local area networks.
Work Performed - Consulting, claim construction, claim chart preparation, technical tutorials.

Microsoft Corporation v. Commonweatlh Scientific and Indus. Research Org.*
Fulbright and Jaworski LLP, Houston, TX USA
Technical Consultant, Intellectual Property Litigation   **2006 - 2007**
Case Subject Matter - High speed data rate communications for wireless local area networks.
Work Performed - Consulting, claim construction, claim chart preparation, technical tutorials.

Tantivy Communications, Inc.* v. Lucent Technologies, Inc.
Fulbright and Jaworski LLP, Houston, TX USA
Technical Consultant, Intellectual Property Litigation   **2004 - 2005**
Case Subject Matter - CDMA2000 based cellular networks, including data retransmission algorithms at multiple layers.
Work Performed - Consulting, claim construction, claim chart preparation, technical tutorials.

Volunteer Organizations

Rice Alliance for Technology and Entrepreneurship Austin, Texas, USA
Executive Committee   **2009 - Present**
The Rice Alliance for Technology and Entrepreneurship strives to improve the entrepreneurial ecosystem of Central Texas by: helping entrepreneurs successfully found, fund, grow and exit new companies, helping investors successfully identify and engage with promising new ventures, and showcasing emerging technologies and business models to further educate and engage the community.

Capital Factory, TX USA
Mentor   **2014 - Present**
Mentor, advisor and investor in one of the most successful start-up accelerators in the United States.

OwlSpark - Rice University, Houston, Texas, USA
Mentor   **2014**
Mentor and advisor to university based early stage technology companies within Rice University's accelerator program.

Incubation Station, TX USA
Mentor   **2013**
Incubation Station is an accelerator that brings together a consortium of Austins notable entrepreneurs, investors and advisors for the purpose of mentoring high-potential, market-validated consumer product companies to more effectively manufacture, distribute, market and grow their products and services.

Honors and Awards	Texas Instruments Fellowship Recipient
	Nokia Grant Recipient
	National Science Foundation Grant Recipient
	Rice University Fellowship Recipient
	Rensselaer Alumni Scholarship Recipient
	Linear Tech / Mueller Scholarship Recipient
	Rensselaer Polytechnic Institute: Graduated Cum Laude, Deans List All Semesters
	Eta Kappa Nu - National Electrical and Computer Engineering Honors Society
	IEEE Member - Institute of Electrical and Electronics Engineers
	ACM Member - Association For Computing Machinery